

1. In an electrophotographic reproduction machine having a substrate registration system for transporting and registering the substrate and a toner image traveling at a transfer velocity, a method of controlling the velocity of a copy substrates comprising:

decelerating the substrate from a process velocity to a low velocity, wherein the transfer velocity is greater than the low velocity and less than the process velocity;

registering the substrate via the substrate registration system; and
accelerating the substrate to the transfer velocity for image transfer.

2. The method of claim 1 further comprising:

feeding the substrate from a substrate feeder module to the substrate registration system;

sensing the arrival time of the substrate at the substrate registration system; and

sensing the position of the substrate in the substrate registration system.

3. The method of claim 1 wherein:

the process velocity is about 1020 millimeters/second;

the low velocity is about 220 millimeters/second; and

the transfer velocity is about 596 millimeters/second.

4. The method of claim 1 wherein:

the process velocity is about 1530 millimeters/second;

the low velocity is about 450 millimeters/second; and

the transfer velocity is about 894 millimeters/second.

5. The method of claim 1 further comprising transporting the substrate through the registration system via a first pair of simplex drive rollers, a second pair of simplex drive rollers, and a pair of pre-registration drive rollers.

6. The method of claim 5 wherein the transporting step further includes driving the drive rollers with a three phase, brushless, direct current motor.

7. The method of claim 5 wherein the transporting step further includes:

driving the first pair of simplex drive rollers with a three phase, brushless, direct current motor; and

driving the second pair of simplex drive rollers and the pair of pre-registration drive rollers with a stepper motor.

8. The method of claim 1 further comprising:

sending arrival data to a controller; and

determining whether the substrate has arrived early, at a nominal time, or late, in order to maintain repeatable arrival times at the substrate registration system.

9. An apparatus for controlling the velocity of a copy substrate in an electrophotographic reproduction machine having a substrate registration system for transporting and registering the substrate and a toner image traveling at a transfer velocity, the apparatus comprising:

decelerating means for decelerating the substrate from a process velocity to a low velocity, wherein the transfer velocity is greater than the low velocity and less than the transfer process velocity;

registering means for registering the substrate;

accelerating means for accelerating the substrate to the transfer velocity for image transfer.

10. The apparatus of claim 9 further including:

feeding means for feeding the substrate from a substrate feeder module to the substrate registration system;

arrival sensing means for sensing the arrival time of the substrate from the substrate feeder module to the substrate registration system;

position sensing means for sensing the position of the substrate in the substrate registration system.

11. The apparatus of claim 9 wherein:

the process velocity is about 1020 millimeters/second;
the low velocity is about 220 millimeters/second; and
said transfer velocity is about 596 millimeters/second.

12. The apparatus of claim 9 wherein:

the process velocity is about 1530 millimeters/second;
the low velocity is 450 millimeters/second; and
the transfer velocity is about 894 millimeters/second.

13. The apparatus of claim 9 wherein the registration system includes a first pair of simplex drive rollers, a second pair of simplex drive rollers, and a pair of pre-registration drive rollers for transporting the substrate through the registration system.

14. The apparatus of claim 13 wherein the registration system further includes a three phase brushless direct current motor for driving the drive rollers.

15. The apparatus of claim 13 wherein the registration system further includes a three phase brushless direct current motor for driving the first pair of simplex drive rollers and a stepper motor for driving the pair of simplex drive rollers and the pair of pre-registration drive rollers.

16. An apparatus for controlling the velocity of a copy substrate comprising:

a photoreceptor for transferring a toner image to an image transfer station at a transfer velocity;

a substrate registration system, the registration system including a registration transport for driving the substrate and a registration assembly for registering the substrate;

a substrate feeder module for feeding the substrate to the registration transport of the substrate registration system at a process velocity, the process velocity being faster than the transfer velocity; and

a plurality of registration drive rollers for decelerating the substrate to a low velocity, the low velocity being slower than the transfer velocity.

17. The apparatus of claim 16 wherein:

the process velocity is about 1020 millimeters/second;

the low velocity is about 220 millimeters/second; and

said transfer velocity is about 596 millimeters/second.

18. The apparatus of claim 16 wherein:

the process velocity is about 1530 millimeters/second;

the low velocity is about 450 millimeters/second;

the transfer velocity is about 894 millimeters/second

19. The apparatus of claim 16 wherein the registration transport includes a first pair of simplex drive rollers, a second pair of simplex drive rollers, an arrival sensor, a pair of pre-registration drive rollers, and a motor for driving the drive rollers.

20. The apparatus of claim 19 wherein the registration transport further includes a stepper motor for driving the drive rollers, and a plurality of nip release mechanisms for preventing excessive drag on the substrate.